Missouri Spring 2015 Grade Level Assessment

Form Selection

Operational form selections using the Smarter Balanced operational item pool for 2015 Missouri Testing Program from Math and English Language Arts was conducted by CTB and DRC. In addition to the item content information for each item, the statistics in the item pool included Item Response Theory (IRT) parameter estimates.

Three parallel forms were selected for each grade and content area. The test specifications used to develop the MO 2015 assessments were based on the Smarter Balanced test blueprints and specifications released in April 2014. The selection criteria were based on both content requirements and statistical criteria, including the following:

1. A shared anchor was selected for each grade level and content area.
2. Items and forms were selected such that the content coverage matches Smarter Balanced April 2014 blueprints.
3. Test length and item types were selected to match the Smarter Balanced April 2014 blueprints.
4. Forms were selected to have a reasonable difficulty and have characteristics of a vertical scale across grades within the same content area.
5. Extremely difficult or easy items were avoided whenever possible and forms were selected to have items that represented a range of difficulties.

For Grades 5 and 8, one classroom activity and PT items were also selected. For math, two PTs were selected per grade, and for ELA, three PTs were selected per grade.

Table 1 summarizes the total number of items and points and the average IRT discrimination and difficulty parameters (on the ɵ scale) for the selected forms. The parameters are similar across forms per grade/content area.

Figures 1 and 2 show the Test Characteristic Curves (TCCs) for Grades 3-8 Math and ELA. The TCCs generally indicate that test remains the same within grade and increases across grade levels. Note that for Grades 5 and 8 the TCCs do not include the PT items.

Early Return Review

Using an early return sample CTB will evaluate item and student performance. We propose using to use multiple methods based on empirical data and plan to prepare:

- descriptive statistics

- test and item level statistics: reliability coefficients, standard errors of measurement, p-values, distractor analysis
- Item parameter estimates

For each form, the items will be calibrated using the same IRT model that was specified by Smarter and the Stocking-Lord method will be used to evaluate model fit. The comparability of all items parameters will be examined using a visual inspection of the scatter plots of the item parameters and by reviewing the item characteristic curves. Item parameter differences will be evaluated in terms of the mean difference of item difficulty estimates (BIAS) and Root Mean Square Difference (GRMSD). The BIAS and RMSD will be reviewed for all items.

The results of this study will be presented to DESE as soon as they are available and next steps will be discussed.

Table 1: *Form Summary Statistics*.

Content	Grade	Form	# Items	# Points	Mean Discrimination	Mean Difficulty
ELA	3	F1	44	47	0.65	-0.87
ELA	3	F2	44	47	0.66	-0.85
ELA	3	F3	44	47	0.65	-0.85
ELA	4	F1	44	47	0.62	-0.41
ELA	4	F2	44	47	0.65	-0.40
ELA	4	F3	44	47	0.66	-0.40
ELA	5	F1	44	47	0.67	-0.07
ELA	5	F2	44	46	0.68	-0.07
ELA	5	F3	44	46	0.63	-0.07
ELA	6	F1	45	48	0.52	0.26
ELA	6	F2	45	48	0.58	0.24
ELA	6	F3	45	48	0.57	0.26
ELA	7	F1	45	48	0.59	0.53
ELA	7	F2	45	48	0.63	0.52
ELA	7	F3	45	48	0.59	0.52
ELA	8	F1	45	48	0.64	0.69
ELA	8	F2	45	48	0.56	0.69
ELA	8	F3	45	48	0.61	0.70
Math	3	F1	31	33	1.00	-1.01
Math	3	F2	31	33	0.94	-1.00
Math	3	F3	31	33	0.94	-1.00
Math	4	F1	31	33	0.90	-0.37
Math	4	F2	31	33	0.94	-0.37
Math	4	F3	31	33	0.89	-0.39
Math	5	F1	31	34	0.67	0.17
Math	5	F2	31	34	0.71	0.17
Math	5	F3	31	34	0.69	0.16
Math	6	F1	30	31	0.76	0.47
Math	6	F2	30	31	0.81	0.46
Math	6	F3	30	31	0.76	0.46
Math	7	F1	31	32	0.75	0.66
Math	7	F2	31	32	0.71	0.65
Math	7	F3	31	32	0.73	0.65
Math	8	F1	31	36	0.62	0.93
Math	8	F2	31	36	0.60	0.92
Math	8	F3	31	36	0.60	0.99

Figure 1: *ELA Test Characteristic Curves by Form and Grade.*

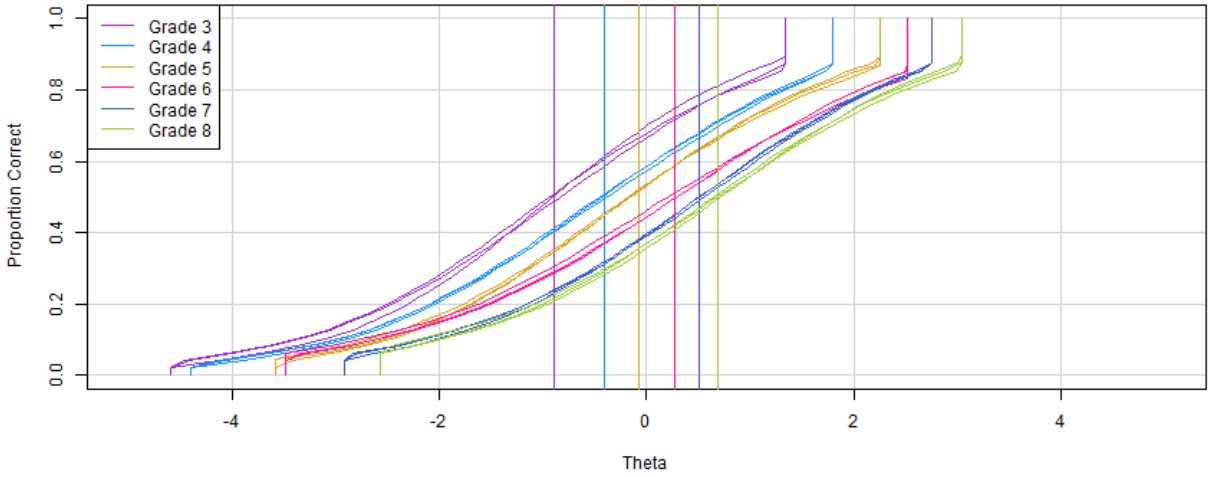

Figure 2: *Math Test Characteristic Curves by Form and Grade.*